

ORIGINAL ARTICLE

Hepatitis B virus infection among Chinese residents in the United Kingdom

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Objective: To determine prevalence of hepatitis B virus (HBV) serological markers in Chinese residents in the United Kingdom.

Method: Retrospective case-controlled study between January 1997 and June 2000 in two genitourinary medicine (GUM) clinics.

Results: 117 Chinese and 234 non-Chinese controls were studied. Baseline characteristics except marital status showed no difference. Overall prevalence of HBV serological markers was 35.8% in Chinese, controls 5.5% ($p < 0.001$). Hepatitis B surface antigen (HBsAg) positive carrier rate was 12.8% in Chinese, controls 0.4% ($p < 0.001$); 1.7% of Chinese patients were also hepatitis B e antigen (HBeAg) positive, none in controls. Natural immunity was acquired in 23.0% of Chinese, controls 5.1% ($p < 0.001$). Prevalence of HBV serological markers in UK born Chinese was 6.7%, non-UK born Chinese 40.1% ($p < 0.011$). Only 7.6% of Chinese had a history of previous HBV vaccination.

Conclusions: Prevalence of HBV serological markers among Chinese patients attending two GUM clinics in London was high and only a minority of Chinese had immunisation against HBV. Although the prevalence of HBV markers in UK born Chinese was lower than non-UK born Chinese, they may be at continuous risk of HBV infection. Non-UK born Chinese patients attending GUM services in the United Kingdom should be targeted for screening and vaccination to reduce HBV transmission.

Hepatitis B virus (HBV) infection is a major cause of acute and chronic hepatitis, cirrhosis, and primary hepatocellular carcinoma worldwide.¹ Currently, the treatment of chronic hepatitis B in Chinese patients is not very satisfactory. Therapy with lamivudine is promising but a long term treatment may be required to maintain viral suppression in those who do not seroconvert to anti-HBe.^{2,3} HBV infection establishes a reservoir of carriers who are able to transmit the infection. In addition to health consequences, HBeAg positive carriers are denied the choice of entering professions such as dentistry and medicine where exposure prone procedures are involved.

HBV infection is highly prevalent in Chinese communities in China, Hong Kong, Malaysia, and other parts of Asia and up to 50% of the population have been exposed to HBV.^{4–6} Despite the high prevalence of HBV infection in the Chinese community outside the United Kingdom, so far the Chinese residents in Britain have not been included in the immunisation programme against HBV infection.⁷ Although current recommendations in the United Kingdom include household and sexual contacts of HBV carriers, it may fail to reach many Chinese at risk as index cases need first to be identified.

The recent National Strategy for Sexual Health and HIV services in the United Kingdom suggests that the needs of minority ethnic groups for prevention of sexually transmitted infections (STIs) should be assessed.⁸ There are no data on the prevalence of HBV infection in Chinese people living in the United Kingdom to guide a screening and vaccination programme for this group of the population. This study was conducted to determine the prevalence of HBV serological markers among patients of Chinese ethnicity attending two GUM clinics in London.

METHOD

This is a retrospective case controlled study. Consecutive new Chinese patients and controls attending the genitourinary medicine (GUM) clinics at the Royal London Hospital and the Moorfields Eye Hospital between January 1997 and June 2000

were studied. Chinese patients and controls were matched for sex; those aged below 16 years and those who did not have tests for HBV serological markers were excluded. Non-Chinese new patients attended before and after each Chinese patient were selected as controls regardless of their country of birth; controls comprised ethnic mixture of white people, Afro-Caribbeans, and others. Both of these GUM clinics offer routine screening for HBV serological markers to all new attendees but not routine HBV vaccination. About 20% of Chinese patients and controls did not have screening for HBV serological markers; in many cases, blood tests were declined by Chinese people and controls.

Blood samples were taken for HBsAg and antibody to hepatitis B core antigen (anti-HBc). In serum samples, which were tested positive for HBsAg, further tests were performed for the determination of HBeAg and anti-HBe. Anti-HBs was checked in those who gave a history of previous HBV vaccination. Both patients and controls were also screened for STIs including gonorrhoea, chlamydia, non-specific urethritis, trichomoniasis, genital warts, genital herpes, and syphilis and were offered HIV antibody test. The data were collected from case notes and laboratory results using standardised proforma.

Statistical analysis

A sample size of 97 patients in the Chinese group was needed to detect a significant difference with 80% power if the predicted prevalence of HBV markers was 10% for Chinese and 1% for controls. The baseline characteristics and HBV serological markers were compared between Chinese people and controls using a χ^2 test. Fisher's exact test was used for analysis of HBeAg positive carrier rate and the prevalence of HBV serological markers in homosexual/bisexual men and in UK born and non-UK born Chinese subgroups.

RESULTS

Study population

A total of 117 Chinese patients and 234 controls (ratio of 1:2) were studied. The distribution of age, sex, sexuality, and the

Table 1 Baseline characteristics of Chinese patients and controls

	Chinese (n=117) No (%)	Controls (n=234) No (%)	p Value (χ^2 test)
Median age (range)	30 years (17–69 y)	29 years (16–70 y)	
Sex			
Male	50 (42.7)	100 (42.7)	1.00
Female	67 (57.3)	134 (57.3)	
Status			
Single	73 (62.3)	178 (76)	0.02
Married	35 (30)	39 (16.6)	
Divorced/separated/widowed	9 (7.7)	17 (7.2)	
Sexuality			
Heterosexuals	109 (93)	217 (92.7)	0.88
Homo/bisexuals	8 (7)	17 (7.3)	
Country of birth			
UK	15 (12.8)	169 (72.2)	
China	29 (24.7)		
Malaysia	28 (23.9)		
Vietnam	12 (10.2)		
Others	33 (28.2)	65 (27.7)	
Presence of STIs other than HBV	36 (30.7)	88 (37.6)	0.21
History of previous HBV vaccination	9 (7.6)	31 (13.2)	0.12

presence of at least one STI at the time of screening were similar in both groups (table 1). One hundred and sixty nine out of 234 (72%) controls were born in the United Kingdom whereas only 15 out of 117 (12.8%) Chinese people were born in the United Kingdom. The majority of Chinese people in this study group originated from various parts of Asia such as China, Hong Kong, Malaysia, Singapore, and Vietnam. The proportion of married people was significantly higher in Chinese patients than in controls ($p=0.02$). The subgroup analysis showed that the median age of UK born Chinese ($n=15$) was 25 years (age range 17–40 years).

Prevalence of HBV markers

The overall prevalence of HBV serological markers, HBsAg positive carrier rate, and proportion of anti-HBc positive and HBsAg negative (natural immunity) patients and HBeAg positive carrier rate in the Chinese people and the control groups are given in table 2. One out of 15 (6.7%) UK born Chinese and 41 out of 102 (40.1%) non-UK born Chinese were positive for anti-HBc ($p<0.011$).

Further analysis showed that one out of eight (12.5%) Chinese and one out of 17 (5.8%) controls were HBsAg positive in the homosexual/bisexual subgroups of men ($p=1.00$). None of the Chinese or non-Chinese homosexual/bisexual men developed natural immunity against HBV.

Vaccination in the studied population

Thirty one out of 234 patients (13.2%) in the control group gave a history of previous HBV vaccination whereas only nine out of 117 patients (7.6%) in the Chinese group had it previously ($p=0.12$). In the Chinese group, seven out of nine indi-

viduals who gave a history of previous HBV vaccination had detectable anti-HBs (>10 IU/l); one had no detectable antibody; one did not have the test. In the control group, 10 out of 31 patients had detectable antibody; three had no detectable antibody; 18 patients did not have test for anti-HBs. One Chinese patient who gave a history of previous HBV vaccination was found to be anti-HBc positive and also had a low level of anti-HBs (10–100 IU/l). None in the control group with a history of previous vaccination had positive anti-HBs.

DISCUSSION

In 1992, the World Health Organization (WHO) recommended that all countries should introduce universal vaccination against HBV into their immunisation schedules by December 1997 regardless of the national prevalence of the infection.^{9 10} This strategy has been implemented in most European countries, the United States, and Canada but not in the United Kingdom.¹¹ However, the United Kingdom has employed a selective strategy for the delivery of HBV vaccine since it first became available. In the United Kingdom, HBV vaccination is currently recommended for high risk groups including babies born to infected mothers, family contacts of carriers, homosexual/bisexual men, and prostitutes.⁷ This strategy, however, failed to include UK residents originating from highly prevalent areas in various parts of the world. Godley *et al* demonstrated a relatively high prevalence of HBsAg (4.1%) in the native West Indian population in the United Kingdom compared to 0.2% in British population attending GUM clinics.¹² A study conducted in a resettlement camp for Indochinese refugees in Great Britain demonstrated that overall prevalence of HBsAg was 15% in all age groups.¹³ A 3 year study in an antenatal population in a London hospital noted that prevalence of HBsAg carriage was 1.7% in Asians and among the HBsAg positive patients, there was a highly significant excess of patients (13 out of 30) born in China and South East Asia.¹⁴ Another anonymous study in women of various ethnic origins attending an antenatal clinic in the United Kingdom showed that prevalence of HBsAg carriage was 7.7% among South East Asians and 1% in Asians from Indian subcontinent.¹⁵ Ethnic differences (white/non-white) in the prevalence of HBV markers were also noticed in two GUM clinics in the United Kingdom.¹⁶ However, none of these studies showed any breakdown on the seroprevalence of HBsAg and/or anti-HBc markers in Chinese patients among the Asians, South East Asians, or Indochinese living in the United Kingdom.

In various parts of China, the overall prevalence of HBV markers is 42.6% and HBsAg carriage was 10.2%.⁴ In Hong Kong, up to 50% of the population have been infected with HBV.⁵ A study in Malaysia showed that the prevalence of HBV was as high as 64.3% and carrier rate was 9.2% among Chinese patients attending STI clinics.⁶ It has been shown that perinatal and horizontal transmission including intrafamilial and interfamilial spread is common among Chinese and other Asians and the carrier rate is high among offspring, siblings, and spouses of female carriers.^{4 16}

Table 2 Hepatitis B serological markers

	Chinese (n=117) No (%)	Controls (n=234) No (%)	p Value (χ^2 test)
HBsAg positive carriers	15 (12.8)	1 (0.4)	<0.001
HBsAg negative and HBcAb positive (natural immunity)	27 (23)	12 (5.1)	<0.001
HBcAb positive +/- HBsAg positive (overall prevalence)	42 (35.8)	13 (5.5)	<0.001
HBeAg positive high risk carriers	2 (1.7)	0	=0.11*

*Fisher's exact test.

Key messages

- Prevalence of hepatitis B virus serological markers was high in non-UK born Chinese living in the UK
- Only a minority of Chinese had vaccinations against hepatitis B virus infection
- Prevalence in UK born Chinese is relatively low
- Non-UK born Chinese attending GUM clinics in the UK should be targeted for screening and vaccination to reduce hepatitis B virus transmission

Our study demonstrated that the prevalence of HBV serological markers in Chinese patients attending GUM clinics in the United Kingdom was high and only a minority had immunisation against HBV. The seroprevalence of HBsAg in Chinese in this study was at least three times as high as homosexual men attending GUM clinics in the United Kingdom.^{17, 18} In addition, the prevalence of HBV serological markers in Chinese and non-Chinese homosexual/bisexual men showed no significant difference. The relatively low prevalence of HBV markers in UK born Chinese suggests that they may either be exposed to HBV for a shorter duration as they were of a younger age group or may experience different pattern of risk from non-UK born Chinese. However, they may be at risk of acquiring HBV from non-UK born Chinese as they continue to share risk factors owing to their common customs and cultural behaviours. Furthermore, the study shows that approximately one third of the Chinese patients with positive anti-HBc markers were also HBsAg positive in contrast with controls in whom the prevalence of anti-HBc was 10 times higher than the prevalence of HBsAg. This suggests that many of these Chinese patients might have acquired the infection early in life by vertical or horizontal transmission (when the rate of progression to the carrier rate is very high). However, from our study, it was not possible to estimate the number of HBV infections acquired in the early life or the number of adult acquired infections occurred among them after they arrived in the United Kingdom, as the study was not designed to look at these factors.

The United Kingdom is less likely to comply with WHO recommendation for universal immunisation against this infection, as current incidence of HBV infection in the general British population is relatively low compared to other parts of Europe.¹⁹ Adopting universal immunisation, though desirable, is deemed not to be cost effective in the United Kingdom. Catering is still the main occupation among the Chinese population. The long working hours in the catering industry as well as the communication difficulties because of language problems have led this population to have poor access to healthcare services.^{20, 21} These barriers put them at a greater health disadvantage. In the absence of routine immunisation for this ethnic group, non-UK born Chinese patients attending GUM services should be targeted for screening and vaccination under the current guidelines to reduce HBV transmission.^{7, 22}

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CONTRIBUTORS

MK was mainly responsible for study design, data collection, and analysis and writing manuscript; BTG had the original idea for the study and contributed to the study design and writing the manuscript.

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